

REMARKS

The Examiner is thanked for the due consideration given the application.

Upon entry of this amendment, claims 8-14 and 17-19 are pending in the application. By this amendment claims 16 and 17 are canceled and their subject matter is generally incorporated into claim 8, and the amendments to claim 8 find further support at page 7, lines 10-24 of the specification. The claims have also been amended to improve their language and to better correspond with amended claim 8.

No new matter is believed to be added to the application by this amendment.

Entry of this amendment under 37 CFR §1.116 is respectfully requested because it cancels claims and places the application in condition for allowance. Alternately, the cancellation of claims reduces issues for appeal.

Rejection Under 35 USC §112, Second Paragraph

Claims 8-14 have been rejected under 35 USC §112, second paragraph as being indefinite. This rejection is respectfully traversed.

The Official Action asserts that the limitation "fixed member portion" is not clear. However, the fixed member has been clarified as being a collar.

Also, the relationship between the collar and the nut has been clarified, as well as the issue of releasability.

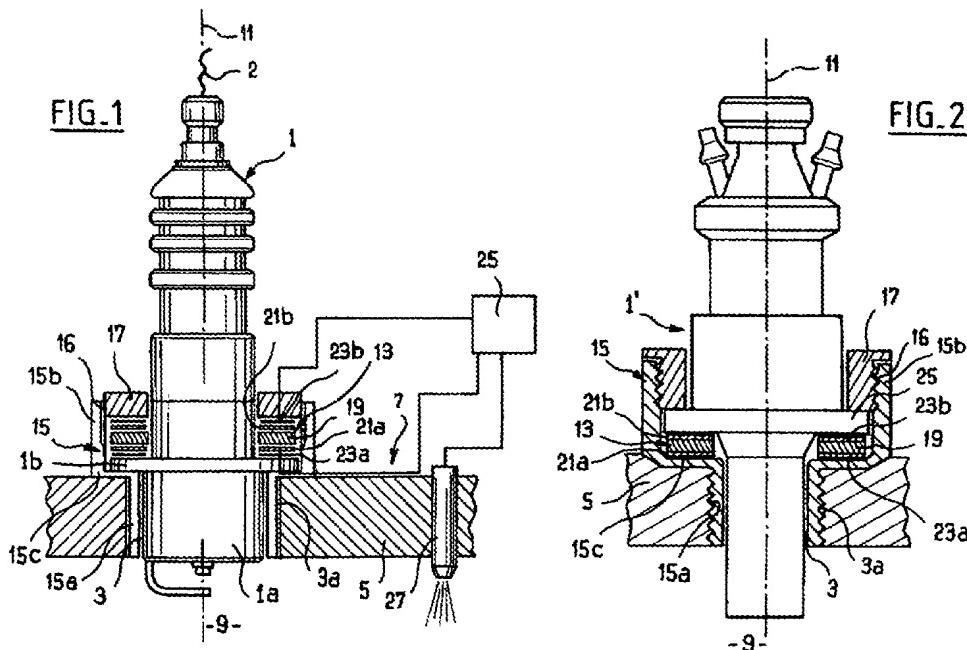
The claims are thus clear, definite and have full antecedent basis.

This rejection is believed to be overcome, and withdrawal thereof is respectfully requested.

Rejection Over HARADA

Claims 8-14 have been rejected under 35 USC §102(b) as being anticipated by HARADA (U.S. Patent 4,392,082). This rejection is respectfully traversed.

The present invention pertains to measuring pressure in an internal combustion engine that is illustrated, by way of example, in Figures 1 and 2 of the application, which are reproduced below.



Figures 1 and 2 show a functional member 1, 1' such as a spark plug or fuel injector. A pressure sensor device 19 is interposed between a fixed member portion and a confronting portion.

In the present invention the functional member (e.g., spark plug) is not screwed into the cylinder head. Attachment is via a collar 15 having an outside portion 15b. The collar 15 is screwed into the cylinder head. A nut 17 secures the collar such that the functional member and the pressure sensor device can be placed into the configuration without being screwed in. This freedom of the functional member permits it to press against the pressure sensing device so as to register as pressure. This functionality is discussed at page 7, lines 10-24 of the specification:

More specifically, during internal combustion, the pressure in the combustion chamber 9 increases and the spark plug 1 is subjected to this. As the plug is not screwed into the orifice 3, this pressure has a tendency to displace it more or less along the axis 11, towards the outside of the chamber 9, correspondingly compressing the sensor 13 between the shoulder 1b and the nut 17. The change in pressure exerted on the piezoelectric element 19 generates a potential difference between the contact rings 21a, 21b. This information is processed by the computer 25 which determines the injection conditions, particularly with reference to an operating model saved in memory, which may make it possible to take account of the state of the engine, whatever its operating history.

These aspects of the present invention are reflected in independent claims 8 and 19.

HARADA pertains to a pressure sensitive ignition plug. The Official Action refers to Figure 1 of HARADA, which is reproduced below.

FIG. I

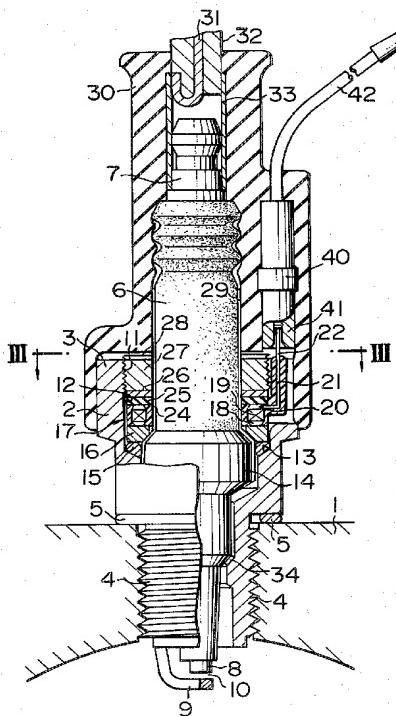


Figure 1 of HARADA shows a spark plug with a spark plug body 2 directly screwed into the cylinder head with threads 4 (note the gasket 5). A piezoelectric element 19 is sandwiched between electrodes 19 and 20 in sensing unit 17. In HARADA it is the internal insulator assembly 6 pressing on pressure receiving ring 16 that initiates the transduction.

In contrast, the present invention does not have a fixed functional element (e.g., spark plug), so that the measured

pressure corresponds to a movement of the entire functional element on the pressure sensor. In comparison, HARADA utilizes an internal component of the spark plug to determine pressure, and HARADA's sensing unit 17 is internal to the spark plug (compare to the external pressure sensor of the present invention).

That is, unlike in HARADA, the spark plug shown in Figure 1 of the present application is a standard one, so it is also formed from an insulator placed in a body, and the present invention does not claim the insulator to be a functional member.

Additionally, independent claim 8 incorporates the subject matter of claims 15 and 16, which were free of this rejection over HARADA.

As a result, HARADA fails to disclose each and every element of claim 8 of the present invention. HARADA thus fails to anticipate claim 8 of the present invention. Claims depending upon claim 8 are patentable for at least the above reasons.

This rejection is believed to be overcome, and withdrawal thereof is respectfully requested.

Rejection Over REED

Claims 8-19 have been rejected under 35 USC §102(b) as being anticipated by REED. This rejection is respectfully traversed.

REED pertains to a method for measuring diesel engine cylinder pressure. Figure 1 of REED is reproduced below.

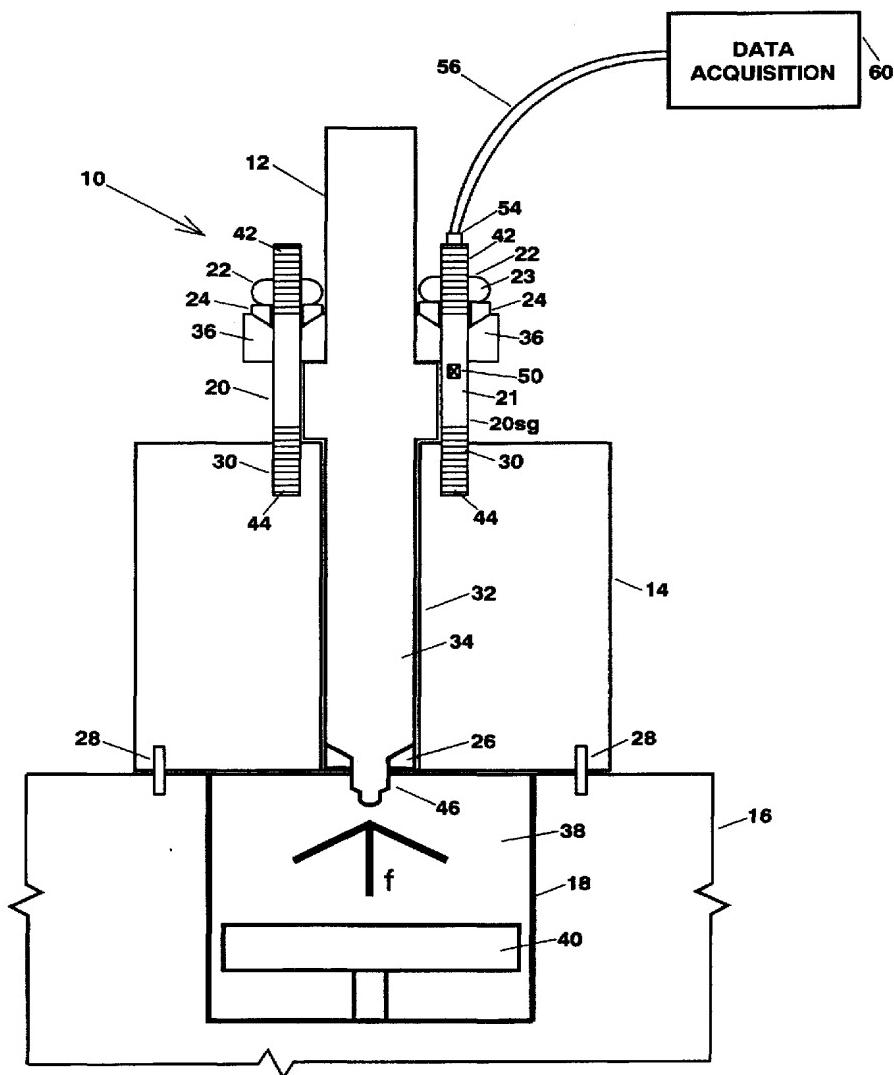


FIG. 1

Figure 1 of REED shows a fuel injector 12, a cylinder block 16 and its corresponding head 14. The head 14 is attached to the cylinder head with stud bolts 28. Above the head are fuel injector studs 20, 21, one of which includes a strain gauge unit 50. The injector studs have threads 42, 44 for attaching to the head and for securing the fuel injector 12.

REED fails to disclose a collar (or a fixed member), much less a collar affixed to a wall of an orifice for the functional unit (e.g., spark plug or fuel injector), such as is set forth in independent claims 8 and 19 of the present invention. REED thus fails to anticipate claims 8 and 19 of the present invention. Claims depending upon claim 8 are patentable for at least these reasons.

This rejection is believed to be overcome, and withdrawal thereof is respectfully requested.

Conclusion

The rejections are believed to have been overcome, obviated or rendered moot and that no issues remain. The Examiner is accordingly respectfully requested to place the application in condition for allowance and to issue a Notice of Allowability.

The Commissioner is hereby authorized in this, concurrent, and future replies, to charge payment or credit any overpayment to Deposit Account No. 25-0120 for any additional fees required under 37 C.F.R. § 1.16 or under 37 C.F.R. § 1.17.

Respectfully submitted,

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